



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

INDUSTRIAL ESTABLISHMENT DISABILITY RECORDS AS
A SOURCE OF MORBIDITY STATISTICS*†BY EDGAR SYDENSTRICKER AND DEAN K. BRUNDAGE, *United States
Public Health Service*

Epidemiology is yet an undeveloped science largely because it lacks the basic data which it must draw from the field of vital statistics. Clinical medicine and bacteriology have made available a large body of material for its use, but since the epidemiological method is essentially the statistical method and epidemiological data are chiefly statistical data, the growth of this new branch of knowledge has so far been one-sided. We cannot hope for its uniform development until accurate and complete statistics of disease incidence in different population groups and under varying conditions of environment are collected currently and in considerable detail.

The statistics of disease incidence which are now available are confined almost entirely to deaths. The grave shortcomings of mortality data as the basic data for statistical research in disease incidence have not, perhaps, been sufficiently realized. In fact, the statement may be ventured that we have been too satisfied with and have attached too much importance to epidemiological conclusions based upon data which relate to only one phase of disease incidence. We are yet greatly in the dark with regard to even the most important facts concerning predisposition to disease, the conditions under which disease begins, and the circumstances which affect or control its course in a population. What we need, what we must have, before satisfactory progress can be made, are morbidity data.

This has been said so often that it has become trite. May it not be said that we have fallen more or less into the habit of regarding complete and accurate morbidity statistics as an impracticable ideal, as a goal impossible of attainment? Is there not in such an attitude this element of danger—a tendency to relax in the endeavor to obtain the desired data simply because they cannot be obtained at once and with the methods which we are accustomed to use in recording mortality?

Before bringing to your attention a possible field for morbidity research, a brief consideration of the situation with regard to morbidity statistics seems pertinent.

The data upon which morbidity statistics are now based necessarily are less uniform, less complete, and less accurate than those which are

* From the Statistical Office, United States Public Health Service.

† Read at the Eighty-second Annual Meeting of the American Statistical Association, Atlantic City, New Jersey, December, 1920.

the foundation of mortality statistics. A death is an event of which the local public, in the performance of certain governmental functions and in the observance of certain social conventions, must take cognizance. The fact that a citizen has ceased to live is usually recorded: at least, some statement of the cause of his demise is placed upon the public books, and certain facts as to his nativity, sex, age, marital condition, residence, occupation, and the like are ascertained. His remains cannot be disposed of until these things are done. We have, therefore, a set of mortality records which are gradually becoming more uniform, more complete, and more accurate. An illness, on the other hand, is a commonplace happening unless the affected individual is regarded as a menace to the community. A case of leprosy, of typhus fever, of bubonic plague, or even of smallpox or scarlet fever, is important enough in the public mind as a source of danger to be reported and isolated. But a disability resulting from tuberculosis or from a non-communicable disease equally as serious to the individual and, indirectly, to the community is such an every-day affair that only by the most searching inquiry can its occurrence be ascertained and recorded.

The obstacles actually encountered in obtaining morbidity reports for a given population or population groups are well known to vital statisticians. The chief difficulties may be expressed in three statements:

(1) Only such diseases can be reported as come to the attention of physicians and other diagnosticians. These diseases ordinarily are brought to their attention only at a stage when discomfort, pain, or disability is experienced; in their incipient and latent stages, when they are not noticed even by the individual affected or do not interfere with his normal activities, but when their importance is equally as great or even greater, they are not reported.

(2) Only such cases are reported as are (a) notifiable under the law, and of these (b) only the ones that the physician or other reporting agency is willing to report.

(3) Even when the occurrence of an illness is reported, the diagnosis is frequently less accurate than a statement of cause of death. This is inevitably so for the reasons that the illness itself may be merely a symptom of one or several diseases, that it is not always practicable to apply established tests, and that the individual affected cannot be under sufficiently close observation to obtain the necessary clinical evidence.

How, then, are we ever to obtain the necessary material for statistical analysis or epidemiological research?

Let us examine, for a moment, the possible sources of morbidity data. Keeping in mind the fact that the occurrence of disease in a population for which certain facts as to race, sex, age, and various environmental conditions can be known, is the goal, we may classify the various sources into three general groups, as follows:

1. Reports of diseases that are "notifiable" under law, which are made by physicians and other diagnosticians to health authorities.

2. Disability or sickness records for persons associated into insured groups, for persons employed in certain industrial establishments maintaining fairly detailed supervision of the health of their employees, for persons living in various institutions, and in the armed forces of the United States.

3. Special surveys of observed groups of persons that are made with the specific purpose of obtaining accurate records of the incidence of a given disease. These studies are, of course, researches in their purpose and character.

It will be seen at once that the first source of material mentioned—the reports of certain notifiable diseases which have accumulated in every health department—does not begin to satisfy the elementary requirements for statistics of disease incidence. The reports are by no means complete for any disease, even assuming the diagnosis to be trustworthy. They do not contain accurate or sufficient data regarding conditions under which the disease occurs. The decennial enumeration of the population as to specific occupation, for example, cannot be utilized, and the cases are not reported for any definitely enumerated population from any point of view. The third source of material obviously is of a special kind, and its scope and its usefulness are limited only by the amount of money and time spent and by the ability of those who are making the research. The second group of sources of data, on the other hand, afford at the present time more encouragement of a practical sort for obtaining *current* facts as to disease incidence for a definitely known exposure under a limited number of important conditions than either health department records or the results of special surveys.

In this belief, the attempt is being made by the statistical office of the Public Health Service to collect current records of disability (exclusive of those due to industrial accidents) occurring among employees of industrial establishments. The project was planned with the assistance of a committee of the American Public Health Association.*

* The plan for standardized sickness records and reports is contained in the following Public Health Reports:

1. *Report of Committee on Industrial Morbidity Statistics*, Reprint No. 484.
2. *Continuation Report of the Committee on Industrial Morbidity Statistics*, Reprint No. 564.
3. *Sickness Records for Industrial Establishments*, Reprint No. 573.
4. *Diseases Prevalent among Steel Workers in a Pennsylvania City*, Issue of December 31, 1920.

Since very few plants maintain records of specific causes of disability among their employees, it was necessary to utilize records of such sick-benefit associations of employees as were willing to conform to a standard system of records and reports. These records show for each case of disability the date on which cash "benefits" commenced (usually the third, fifth, or seventh day of disability), the number of days for which benefits were paid, and the cause of disability as stated on a physician's certificate. At the present time, about sixty such associations are coöperating with the Public Health Service, although not all of them have made the changes in their method of recording and reporting disabilities that are necessary to conform to either of the "standard" methods suggested by the committee and the Public Health Service. The total membership of these associations at last report was approximately 250,000; because of reductions in force, this "exposure" will probably be considerably decreased. Two standard methods of recording and reporting disabilities were proposed to industrial establishments and sick-benefit associations in order to secure their sickness experience as well as to assist them in utilizing and analyzing their own records as a basis for preventive work. (1) One method requires a record of the number of persons considered by sex and occupation (or department within the plant), and a record of every case of disability for which sick benefits are paid, showing the date of onset (*i. e.*, the date on which disability commenced), duration (*i. e.*, the number of days for which sick benefits were paid), diagnosis, and occupation (or department) in which the disabled person is employed. (2) The other plan includes not only the data required in (1) but also contemplates a greater amount of detailed information, such as the age, race, length of time in occupation, etc., for both the persons considered and the cases of disability among such persons. The latter plan requires a rather detailed system of individual cards and only a few plants are at present in a position to put it into effect.

Although the work of utilizing these records, after placing them on either of the so-called standard plans, is still in an experimental stage and the policy of retrenching as much as possible on all expenditures for records is being practiced in industrial plants generally at the present time, it is believed that the use of such records can be developed to serve two important purposes: (1) to furnish fairly current information regarding the incidence of disease among a representative group of wage-earners in different industries, and (2) to accumulate a mass of data relating to the causes of disability among a large number of adult persons of different race, sex, age, and occupation and industry.

Since the plan has been inaugurated only a few months, the material

so far collected is not sufficient to warrant definite conclusions on any of the essential points. The data cannot be presented here in detail, but for purposes of illustration we will call attention to two tabulations. One shows the monthly variation in diseases which caused disabilities of seven days or longer in a group of plants during the first eight months of 1920; the other shows the incidence of various diseases causing a disability of more than one day during a 12-month period in a large industrial plant.

Taking up first the monthly variations in disease incidence among the members of certain sick-benefit associations of employees in a group of industrial establishments: The number of persons considered varied from 14,208 in January to 62,757 in July, and the number of industrial establishments from 8 in January to 25 in July. The annual incidence rates per 1,000 persons for sicknesses causing inability to work for seven days or longer by months were as follows: January 275, February 327, March 126, April 103, May 77, June 67, July 67, August 54. An extremely wide seasonal variation thus is manifested, the rate for February being approximately six times the rate for August. It will be recalled that the recrudescence of epidemic influenza occurred in the first three months of 1920, particularly in February, and in order to find out to what extent the epidemic influenced the seasonal variation in disease incidence, the following table and graph were prepared, showing the monthly incidence rates of influenza and grippe in comparison with the rates for the principal disease groups. Cases diagnosed either as influenza or as grippe were combined, because the terms were often used interchangeably in reporting the epidemic.

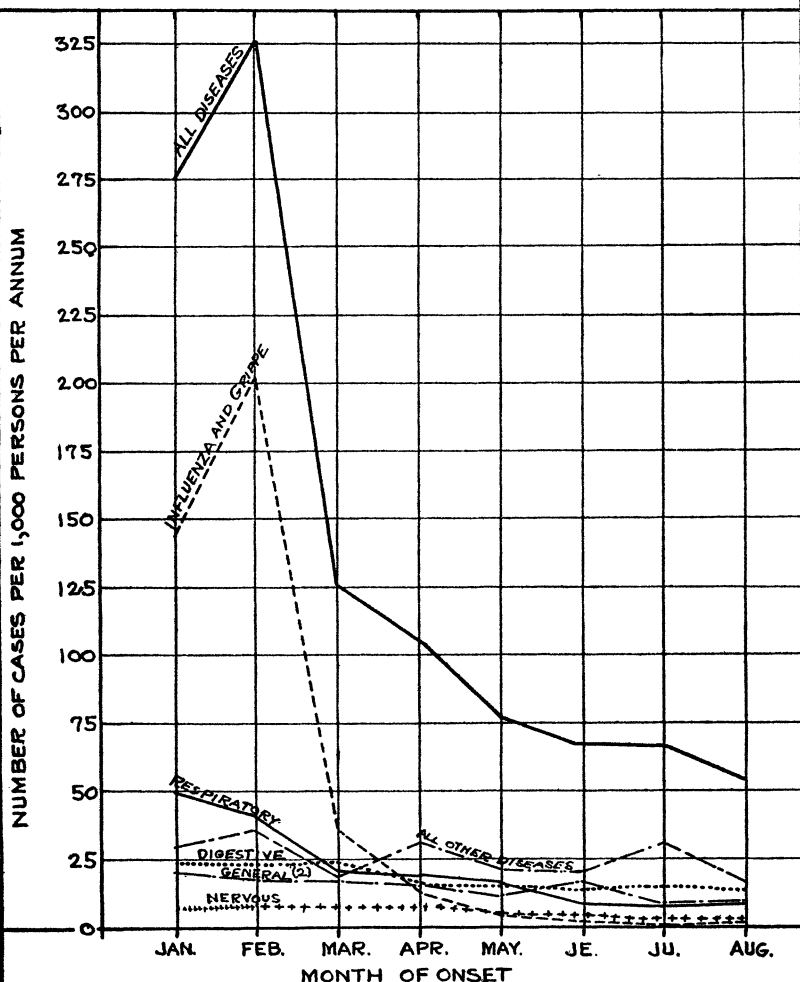
In the first two months of the year the frequency rate for influenza and grippe, it is seen, was larger than the frequency rate for all other diseases combined; in March, however, the number of new cases of influenza and grippe dropped perceptibly below the rate for all other diseases, and gradually diminished to the negligible incidence of 0.8 cases per 1,000 in July. The occurrence of the epidemic in the months in which sickness ordinarily is heavy accentuated markedly the usual seasonal variation. Even with influenza and grippe eliminated from the sickness rates, disease occurrence was about twice as frequent in winter as in summer.*

When influenza and grippe are subtracted, there still remains a surprisingly high frequency rate of sickness causing disabilities of seven days or longer. In January this rate was 132 new cases per 1,000 persons on an annual basis, and even in August, the month of lowest

* In regard to the more important diseases and groups of diseases occurring each month, it should be stated that the monthly fluctuations in their incidence, presently to be discussed, were indicated in a general way for each reporting association.

**FREQUENCY OF INFLUENZA AND GRIPPE COMPARED
WITH THE FREQUENCY OF THE PRINCIPAL DISEASE GROUPS,
BY MONTH OF ONSET, JANUARY TO AUGUST 1920.**

ANNUAL NUMBER OF CASES PER 1,000 MEMBERS OF CERTAIN SICK-BENEFIT
ASSOCIATIONS REPORTING TO THE PUBLIC HEALTH SERVICE.⁽¹⁾



(1) INCLUDES ONLY THOSE SICKNESS AND NON-INDUSTRIAL ACCIDENT
CASES WHICH CAUSED ABSENCE FROM WORK FOR ONE WEEK OR MORE.
(2) EXCEPT INFLUENZA AND GRIPPE.

Fig. 1.

TABLE I
FREQUENCY OF INFLUENZA AND GRIPE COMPARED WITH THE FREQUENCY OF THE PRINCIPAL DISEASE GROUPS,
BY MONTH OF ONSET, JANUARY TO AUGUST, 1920*

Month of onset	Number of associations reporting	Membership	Number of cases per 1,000 persons per year							
			All diseases and conditions	Influenza and grippe	Other diseases and conditions					
					Total	Diseases of respiratory system	Diseases of digestive system	General diseases†	Diseases of the nervous system	All other diseases
January.....	8	14,208	275.0	142.9	132.1	49.9	24.1	20.8	7.5	29.8
February.....	13	22,249	326.7	201.4	125.3	40.8	22.7	17.5	8.5	35.8
March.....	14	23,527	126.0	37.1	88.9	21.1	24.1	17.1	8.0	18.6
April.....	18	30,075	103.4	13.2	90.2	19.4	15.6	16.6	8.0	30.6
May.....	22	58,302	76.7	4.6	72.1	16.8	15.3	12.2	5.9	21.9
June.....	25	62,344	67.1	2.3	64.8	9.2	14.1	15.8	5.0	20.7
July.....	25	62,757	67.3	.8	66.5	8.1	15.2	8.7	3.8	30.7
August.....	24	60,304	54.4	1.1	53.3	9.1	13.9	9.4	3.8	17.1

* Annual number of cases per 1,000 members of certain sick benefit associations reporting to the Public Health Service. Only cases lasting 7 days or longer are included.

† Except influenza and gripe.

incidence in the 8-month period, the annual rate was over 50 per 1,000. This is true in spite of the fact that the members of a large proportion of the associations are a selected group.*

In lieu of a more satisfactory basis for classifying the diseases, and in accordance with the recommendations of the American Public Health Association's committee, the groupings appearing in the International List of the Causes of Death have been utilized in our tabulations. On this basis, the outstanding causes of disability are found in the "general" (from 10 to 164 per 1,000), the "respiratory" (from 8 to 50 per 1,000), and the "digestive" (from 14 to 24 per 1,000), these three groups accounting for from 49 to 86 per cent of all disabilities lasting seven days or longer. The wide fluctuation in the general diseases was caused almost entirely by influenza and grippe. Rheumatism does not show so great a seasonal fluctuation as might have been expected; the rate from this cause was high during the period January-June, showing a slight tendency to become less frequent in July and August. The tuberculosis rate varied between 1 and 3 per 1,000 persons per year which seems to indicate a relatively slight disability from tuberculosis lasting seven days or longer. It may be offered in explanation that many cases which actually began in the period under consideration probably had not yet reached a stage involving actual incapacity for work.

It is interesting to note that occupational poisonings are almost entirely absent in this list as a cause of disability. Two possible reasons for this fact may be advanced: (a) That poisonings do not ordinarily incapacitate for as long as seven days, and (b) that they are not accurately diagnosed. The group of respiratory diseases, as may be expected, exhibits a marked seasonal fluctuation. This variation is true of each and all of the diseases in this group, the disabilities caused by bronchitis and pneumonia being the outstanding features. The relatively high rate from the digestive diseases in the first three months of the year is accounted for chiefly by diseases of the pharynx, of which

* Twelve of the 27 associations specify definite age limits for eligibility to membership, the average limits being from 17 to 55 years of age. In some other respects, too, industrial employees are a distinctly selected group. Temporary or casual laborers are seldom admitted to membership, and some may be too poor to afford the cost of insurance. Women have not the privilege of belonging to some of the reporting associations, and in those reporting associations which do have female members their number is relatively small, so that the sickness rates presented could not be affected to any appreciable extent by the greater frequency of illness among women. Furthermore, not all diseases are included in the tabulations, as sick benefits are denied for the venereal diseases, and six of the 27 reporting associations in this group refuse to pay benefits for chronic diseases contracted prior to the date of joining the association. Sixteen of the associations do not pay for disabilities brought on by the use of intoxicating liquors; eleven decline to pay for disabilities resulting from the violation of any civil law; and eight for the results of wilful or gross negligence. Just how rigidly these rules are enforced is not known, but, considering these restrictions, the statistics should be regarded as a *minimum* statement of the disabilities actually occurring and lasting seven days or longer.

TABLE II

ANNUAL NUMBER OF CASES OF SICKNESS CAUSING DISABILITY FOR ONE WEEK OR LONGER PER 1,000 MEMBERS OF SICK-BENEFIT ASSOCIATIONS IN CERTAIN INDUSTRIAL ESTABLISHMENTS REPORTING TO THE PUBLIC HEALTH SERVICE: BY MONTH OF ONSET, JANUARY TO AUGUST, 1920, AND BY DISEASE CAUSING DISABILITY

Disease or condition causing disability (with corresponding title numbers in parentheses from the International List of the Causes of Death)	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
All Diseases and Conditions (a)	275.0	326.7	126.0	103.4	76.7	67.1	67.3	54.4
General Diseases	163.7	218.9	54.2	29.8	16.8	18.1	9.5	10.5
Typhoid fever (1)	1.7	...	.5	.5	.4	...	.4	.6
Influenza and gripe (10)	142.9	201.4	37.1	13.2	4.6	2.3	.8	1.1
Tuberculosis of the lungs (28)	2.5	1.1	3.0	.9	.9	2.3	1.2	1.3
Cancer—all forms (39-46)	...	1.1	.5	.9	.7	...	.6	.8
Rheumatism (47, 48)	6.6	6.8	5.5	7.6	5.0	6.7	3.0	3.6
Occupational poisonings (57, 58)	...	...	...	...	...	.2	...	...
Others (2-9, 11-27, 29-38, 49-56, 59)	10.0	8.5	7.5	6.6	5.2	6.5	3.4	3.2
Diseases of the Nervous System	7.5	8.5	8.0	8.0	5.9	5.0	3.8	3.8
Neuralgia and neuritis (73)	4.2	2.8	2.0	.5	1.7	.8	1.4	1.3
Cerebral hemorrhage, apoplexy and paralysis (64-66)	.8	...	.5	.5	.2	.2	.2	...
Insanity (67, 68)	.8	1.1	1.5	.5	.2	.2	...	.6
Others (60-63, 69-72, 74)	1.7	2.3	3.0	4.3	1.5	2.3	1.6	1.5
Diseases of the eyes (75)	...	.6	...	1.9	1.5	1.1	.4	.4
Diseases of the ears (76)	...	1.7	1.0	.5	.7	.4	.2	...
Diseases of the Circulatory System	2.5	5.1	4.5	3.3	4.8	2.9	4.0	2.1
Diseases of the heart (77-80)	1.7	2.3	1.0	1.4	1.7	1.1	2.2	1.1
Diseases of the veins (83)	.8	2.3	2.5	1.4	1.7	1.5	1.4	.6
Others (81-82, 84-85)	...	.6	1.0	.5	1.3	.4	.4	.4
Diseases of the Respiratory System	49.9	40.8	21.1	19.4	16.8	9.2	8.1	9.1
Bronchitis (89, 90)	21.6	19.3	12.0	8.5	6.3	3.2	3.8	3.4
Pneumonia (91, 92)	15.8	12.5	2.5	4.7	5.0	1.9	1.6	1.9
Others (86-88, 93-98)	12.5	9.1	6.5	6.1	5.5	4.2	2.6	3.8
Diseases of the Digestive System	24.1	22.7	24.1	15.6	15.3	14.1	15.2	13.9
Diseases of the pharynx (100)	15.0	12.5	10.0	7.1	5.5	4.0	3.4	3.4
Diseases of the stomach (102, 103)	4.2	5.1	5.5	3.8	3.1	2.9	4.4	3.6
Diarrhea and enteritis (105)	1.7	1.1	2.0	...	.7	1.3	1.0	1.9
Appendicitis (108)	3.3	2.3	2.5	1.9	2.8	2.5	3.4	3.0
Hernia (109)	...	1.1	1.0	2.4	2.4	2.1	.8	1.1
Others (99, 101, 106, 107, 110-118)	...	.6	3.0	.5	1.5	1.3	2.0	1.1
Diseases of the Genito-Urinary System	2.5	3.4	.5	1.4	1.7	1.1	1.4	.6
Acute nephritis and Bright's disease (119, 120)	2.5	.6	...	...	...	.6	...	...
Others (121-133)	...	2.8	.5	1.4	1.7	.4	1.4	.6
The Puerperal State . . . . .	...	...	...	...	...	...	...	...
Diseases of the Skin and Cellular Tissue	5.8	7.4	2.5	5.2	2.2	2.7	4.9	2.5
Furuncle (143)	3.3	3.4	1.5	3.8	.7	1.3	2.6	.6
Others (142, 144, 145)	2.5	4.0	1.0	1.4	1.5	1.5	2.2	1.9
Diseases of the Bones and Organs of Locomotion	4.2	1.7	3.0	2.4	3.7	1.7	2.4	2.3
Diseases of the bones (146)	.8	.6	...	.5	.7	...	.2	.4
Diseases of the joints (147)	...	...	1.5	.5	1.1	.4	.8	.2
Others (148, 149)	3.3	1.1	1.5	1.4	2.0	1.3	1.4	1.7
Senility . . . . .	...	...	...	...	...	...	...	...
External Causes (155-186)	3.3	10.8	2.5	13.2	6.1	7.6	12.1	6.3
Ill-Defined Diseases and Conditions (187-189)	11.6	7.4	5.5	5.2	3.3	4.6	5.7	3.2

(a) Except those mentioned in the footnote on p. 591.

tonsillitis is the most important. Disability due to tonsillitis is shown to be astonishingly great. Eliminating pharyngeal affections, the digestive diseases exhibit a fairly constant rate throughout the 8-month period. Seasonal disabilities arising from these causes do not show the anticipated increase in the summer months.

TABLE III

ANNUAL NUMBER OF CASES OF SICKNESS PER 1,000 FOR ALL REPORTING SICK-BENEFIT ASSOCIATIONS, AND FOR EACH REPORTING ASSOCIATION HAVING MORE THAN 500 MEMBERS, BY MONTHS, JANUARY TO AUGUST, 1920*

(Where blank spaces appear the statistics were not available)

Sick-benefit associations	Average membership	Number of cases per 1,000 persons per year							
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
All reporting associations	41,721	275	327	126	118 ^b	80 ^b	71 ^b	74 ^b	59 ^b
Group I ^c	34,936	266	283	118	109	71	67	67	55
A	8,528	170	118	60	45	26	38	36	38
B ^d	2,890	548	785	252	175	150	119	120	...
C	6,813	...	272	133	102	77	61	75	53
D	4,125	...	...	...	...	108	101	98	72
E	18,671	...	...	...	...	61	52	46	59
F	3,169	...	...	...	...	...	64	48	40
G	5,286	...	...	...	...	59	65	62	17
H	4,301	...	...	...	204	125	130	170	112
Group II ^e	4,858	362	616	130	120	133	97	101	78
N	879	270	620	148	70	136	70	146	131
O	553	...	461	83	153	43	44	21	21
P	626	527	648	200	151	203	137	39	119
Q	697	328	700	152	157	135	122	101	118
R	1,134	...	...	85	55	94	76	101	51
S	1,193	...	...	...	175	190	97	191	30
T	922	...	...	...	113	111	133	133	95
Others ^f	1,927	132	338	212	208	145	115	154	92

* Includes only those sickness and non-industrial accident cases which caused absence from work for one week or longer.

^b Rate for all reporting associations from April to August differs from the rate for all diseases shown in Table II, because association H, which does not report diagnosis, is included in this table.

^c Associations which have more than 3,000 members.

^d Included with the large associations because the membership is nearly 3,000.

^e Associations which have less than 3,000 members.

^f Associations which have less than 500 members.

When the frequency rates from all diseases are compared for establishments (see Table III), extraordinarily wide differences are shown in every month. In February, for instance, the frequency rate for association A was 118 per 1,000, while for association B it was 785 per 1,000; and in July Association H had nearly five times as much sickness as Establishment A. It was observed that similar differences appeared in the rates among the smaller associations. These marked differences afford strong reasons for a careful study not only of the causes of illness in the different plants, but of the conditions which give rise to them. Although it is not the purpose to analyze these differences at this time, since the records for the different associations are not sufficiently comparable with respect to the period covered, the value of

statistics of this nature will, it is believed, become more and more manifested as they accumulate.

As an example of the data afforded by records of sickness causing a disability of *one* day or longer, we present a tabulation of the experience of a rubber manufacturing company employing 18,000 persons during the year ending October 31, 1920. Although this company endeavors to obtain the diagnosis of each case of illness by requiring employees resuming work after illness to check in through the medical department, there were a large number of unclassified cases. The illnesses for which no diagnoses were recorded, however, were of short duration, the average being less than 3 working days. It may be assumed, accordingly, that the more serious diseases have been properly classified, and that the unclassified cases probably are mostly colds, headache, constipation, dysmenorrhea, and other conditions that disable for only two or three days. The cases for which no diagnosis was recorded constituted 36 per cent of the male cases and 42 per cent of the female cases, and since the difference is slight, it is believed that comparisons of the recorded diseases according to sex are sufficiently accurate for all practical purposes.

This experience shows a frequency rate of sickness, based on reported cases which terminated within the year, of 1,933 per 1,000 among 16,400 male employees on the factory payroll (office workers not having been included in the record). This is virtually two cases of disabling sickness per man per year. The rate for the 1,625 female factory workers was considerably higher—*i. e.*, 2,565 cases per 1,000.

In view of the estimate of 6.9 working days as the average loss of time per person per year, based on the sickness surveys of the Metropolitan Life Insurance Company in 1916 and 1917, it is interesting to find that the number of work days lost in the rubber manufactory during the year ending October 31, 1920, was 9.3 per male employee, and 13.8 per female employee. The average duration of disability was found to be 4.8 working days per male case, and 5.4 working days per female case. The women, therefore, not only were sick oftener, but failed to recover as rapidly as the men.

Considering first the incidence of the principal groups of diseases among persons of different sex, the statistics for this company show that the frequency of incapacitating illness was greater among the females for all disease groups except diseases of the circulatory system, diseases of the skin, and diseases of the bones, and in each of these three groups the number of female cases was not large enough to be conclusive, but only suggestive of the possibility that a larger number of cases might show the same results. The severity of disease as measured by

TABLE IV

PREVALENCE OF DISABLING DISEASES AMONG EMPLOYEES OF A LARGE RUBBER COMPANY DURING THE YEAR ENDING OCTOBER 31, 1920

Based on reported cases which caused absence from work for one day or longer and which terminated within the year.

Disease or condition causing disability (with corresponding title numbers in parentheses from the International List of the Causes of Death)	Cases per 1,000		Days lost per case		Days lost per person	
	Males	Females	Males	Females	Males	Females
All Diseases and Conditions	1933.0	2565.3	4.81	5.38	9.30	13.80
I General Diseases	275.1	297.2	9.79	12.16	2.69	3.61
Typhoid fever (1)	.5	..	41.25	..	.02	..
Malaria (4)	1.5	4.3	5.04	4.57	.01	.02
Smallpox (5)	3.0	3.7	13.61	12.00	.04	.04
Measles (6)	9.9	14.7	11.81	16.29	.12	.24
Scarlet fever (7)	7.8	16.0	18.47	28.77	.14	.46
Diphtheria and croup (9)	1.0	5.5	7.94	6.33	.01	.04
Influenza and grippe (10)	172.5	180.2	7.21	8.22	1.24	1.48
Dysentery (14)	2.6	2.5	2.21	3.50	..	.01
Erysipelas (18)	1.5	3.1	17.80	17.40	.03	.05
Mumps (19)	18.5	14.8	10.06	11.96	.19	.18
Chicken pox (19)	.6	.6	8.90	5.00	..	..
Infections (20)	9.6	15.4	7.73	5.60	.07	.09
Tuberculosis of the lungs (28)	2.6	2.5	60.86	235.25	.16	.58
Acute miliary tuberculosis (29)	2.0	2.5	47.94	36.00	.10	.09
Tuberculosis of other organs (30-35)	.4	..	38.00	..	.01	..
Syphilis (37)	1.8	3.1	24.13	30.00	.05	.09
Gonococcus infection (38)	6.1	3.1	9.72	14.60	.06	.04
Cancer—all forms (39-46)	1.0	..	54.50	..	.05	..
Rheumatism (47, 48)	31.1	24.0	10.73	7.46	.33	.18
Diabetes (50)	.2	..	59.25	..	.02	..
Exophthalmic goiter (51)	.2	.6	45.00	16.00	.01	.01
Anæmia (54)	.5	..	70.13	..	.03	..
Alcoholism (56)	.2	..	3.33	..	..	..
Chronic poisonings (57-59)	..	..	..	..	..	..
Other general diseases . . . . .	..	.6	..	16.00	..	.01
II Diseases of the Nervous System	36.2	40.0	7.67	7.06	.28	.28
Cerebral hemorrhage, apoplexy, and paralysis (64-66)	..	.6	22.84	6.00	.01	..
Mental alienation (67-68)	..	..	6.29	..	..	..
Epilepsy (69)	.4	..	7.50	..	..	.01
Chorea (72)	..	1.2	5.71	5.65	.04	.07
Neuralgia and neuritis (73)	6.8	12.3	22.24	30.50	.04	.04
Sciatica (73)	1.8	1.2	29.00	..	..	..
Other diseases of the nervous system . . . . .	..	..	5.09	4.52	.07	.07
Diseases of the eyes (75)	13.7	16.7	8.94	10.92	.12	.09
Diseases of the ears (76)	13.1	8.0	..	..	..	..
III Diseases of the Circulatory System	12.2	9.1	9.05	26.47	.11	.24
Endocarditis and other organic heart diseases (78, 79)	1.3	1.8	17.50	90.33	.02	.17
Hemorrhoids (83)	5.2	1.2	7.92	11.50	.04	.01
Other diseases of the veins (83)	.5	1.2	11.13	17.50	.01	.02
Other diseases of the circulatory system	5.2	4.9	7.82	8.50	.04	.04
IV Diseases of the Respiratory System	279.2	314.4	4.59	6.17	1.28	1.94
Excessive colds (86)	195.8	219.0	3.31	3.91	.65	.86
Other diseases of the nasal fossae (86)	20.7	26.5	3.73	4.35	.08	.12
Diseases of the larynx (87)	5.2	6.8	3.41	6.45	.02	.04
Bronchitis (89, 90)	43.1	37.5	7.95	16.18	.34	.61
Pneumonia (91, 92)	6.2	11.7	14.98	20.79	.09	.24
Pleurisy (93)	6.8	11.7	9.24	6.00	.06	.07
Asthma (96)	1.2	.6	30.65	2.00	.04	..
Other diseases of the respiratory system . . . . .	.2	.6	12.00	3.00	..	..
V Diseases of the Digestive System	394.3	422.2	4.51	5.68	1.78	2.40
Diseases of the mouth (99)	12.9	23.4	3.63	5.95	.05	.14
Tonsillitis (100)	171.7	238.8	4.99	6.29	.86	1.50
Other diseases of the pharynx (100)	19.5	4.3	3.09	2.86	.06	.01
Ulcer of the stomach (102)	.4	.6	31.43	6.00	.01	..
Other diseases of the stomach (103)	84.1	68.3	3.20	3.80	.27	.26
Diarrhoea and enteritis (105)	26.7	25.2	3.03	3.07	.08	.08
Appendicitis and typhlitis (108)	11.2	13.6	14.79	16.18	.16	.22
Hernia (109)	4.1	1.8	21.93	12.33	.09	.02
Constipation (110)	37.3	12.3	2.56	2.10	.10	.03
Other diseases of intestines (110)	24.5	30.2	3.24	3.18	.08	.10
Biliary calculi (114)	.2	.6	7.33	3.00	..	..
Other diseases of the digestive system	1.7	3.1	10.57	13.00	.02	.04

TABLE IV—Continued

Disease or condition causing disability (with corresponding title numbers in parentheses from the International List of the Causes of Death)	Case per 1,000		Days lost per case		Days lost per person	
	Males	Females	Males	Females	Males	Females
VI Diseases of Genito-Urinary System . . .	5.4	190.1	14.35	5.71	.08	1.09
Nephritis and Bright's disease (119, 120)	.8	5.5	28.21	56.56	.02	.31
Diseases of the bladder (124)	1.2	7.4	5.68	4.08	.01	.03
Diseases of the testicles (127)	2.7	...	7.38	...	.02	...
Uterine hemorrhage (128)	...	12.3	...	16.70	...	.21
Dysmenorrhea (130)	...	151.4	...	2.58	...	.39
Other diseases of female genitals . . . . .	...	13.5	...	10.82	...	.15
Other diseases of genito-urinary system . .	.7	...	40.18	...	.03	...
VII The Puerperal State . . . . .	...	16.6	...	24.93	...	.42
VIII Diseases of the Skin	51.5	25.8	5.62	6.38	.29	.16
Gangrene (142)	.1	.6	4.00	4.00	...	...
Furuncle (143)	27.4	3.7	4.79	3.50	.13	.01
Acute abscess (144)	5.2	9.9	8.93	6.94	.05	.07
Rash-benzine (145)	5.1	2.5	7.48	4.00	.04	.01
Other diseases of the skin	13.7	9.1	5.34	7.73	.07	.07
IX Diseases of the Bones and Organs of Locomotion	41.1	22.7	5.10	6.24	.21	.14
Diseases of the bones (146)	1.2	.6	10.79	55.00	.01	.03
Diseases of the joints (147)	.8	.6	7.15	7.00	.01	.01
Lumbago (149)	13.2	3.7	5.43	8.00	.07	.03
Myalgia (149)	20.5	14.8	4.12	4.08	.09	.06
Flat feet (149)	4.6	1.8	7.08	6.00	.03	.01
Other diseases of the bones, and organs of locomotion . . . . .	.8	1.2	3.14	2.50	...	...
XII Senility . . . . .	..	...	147.00	...	.01	...
XIII External Causes	45.6	48.6	7.52	6.81	.34	.33
Poisoning by food or drugs (164)	.4	3.7	5.20	6.83	...	.02
Fractures (185)	.9	2.5	23.27	23.75	.02	.06
Other injuries (186)	44.3	42.4	7.21	5.83	.32	.25
XIV Ill-Defined	792.4	1178.6	2.82	2.71	2.23	3.19
Headache (2-189)	87.4	94.8	2.63	3.20	.23	.30
Others	705.0	1083.8	2.84	2.66	2.00	2.89

the days lost per case was greater among the females for each principle disease group except diseases of the nervous system, non-industrial accidents, and diseases of the genito-urinary system. The comparatively short duration of disease of the genito-urinary system among the females is accounted for by the large number of cases and brief duration of dysmenorrhea.

But what specific diseases and conditions were most prevalent among the rubber workers under consideration? The most frequent cause of disability among the males was "excessive colds" for which the case rate was 196 per 1,000. Though severe colds were more frequent among the females than among the males, colds were not the first cause of disability among the women employees. Tonsillitis with a rate of 239 cases per 1,000 was the most frequent cause of female inability to work. There were 388 cases of tonsillitis among 1,625 women, causing an absence of 6.3 days per case, and a day and a half of lost time per woman per year. Severe colds among the men inca-

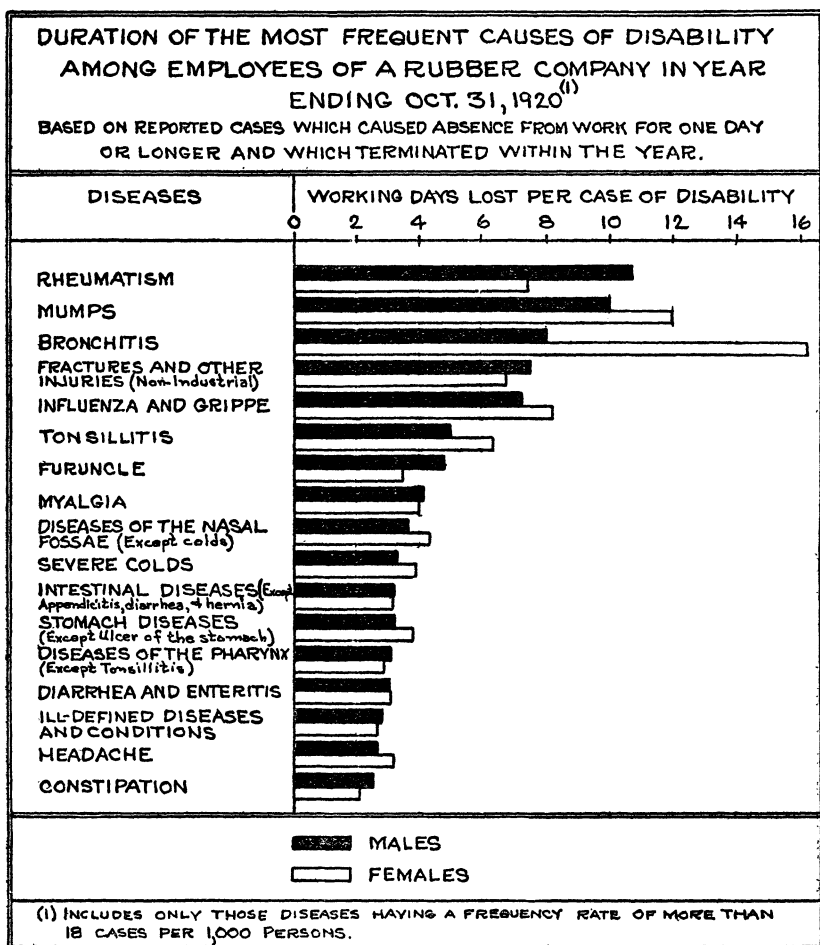


Fig. 2.

pacitated on the average for 3.3 working days, causing a loss of 0.7 of a day per man per year. Among the women hard colds caused an average disability of 3.9 working days per case and 0.9 of a working day per person per year. Influenza and grippe ranked second in point of frequency among the males, and third among the females. Two thousand eight hundred and twenty-seven male cases averaged 7.2 working days lost, and 293 female cases, 8.2 working days lost. Dysmenorrhea was the fourth greatest cause of disability among the women, causing an absence of 2.6 working days per case.

Other interesting sex comparisons might be cited. Headache, for example, was only slightly more frequent among females than among

males. The women were not attacked by bronchitis as frequently as were the men, and their rate for constipation was only one-third of the male rate. The female rate for rheumatism was less than the male rate, and the frequency of boils (furuncle) was only one-seventh of the male rate for this cause of incapacity for work. The women had neuralgia and neuritis more often than the men, and also diseases of the eyes; but men had more diseases of the circulatory system, possibly partly for the reason that a larger proportion were in the older ages. Other points will doubtless suggest themselves to those who desire to examine the tables in greater detail.

Attention is called to Figure 2 which shows the duration of the most frequent causes of disability among both male and female employees of the company.

These two tabulations are presented merely as samples of the material which is afforded in the records of industrial establishments. It is obvious that they are not so complete or so accurate as may be desired, but it is believed that they constitute a definite advance over the fragmentary data available from health departments. It is believed also that when the data are collected in a larger mass, for a longer period, and in greater detail for persons of different occupational status, race, sex, and age, they will afford the first considerable body of dependable material for the use of the statistician in the study of disease incidence as well as for the student of industrial hygiene in its broader aspects. Certainly the employer who desires to know definitely how he can improve most effectively the health of his workers will be aided not only by a more careful scrutiny of his own records when they are intelligently tabulated and analyzed, but by the accumulated experience of other plants.